



AlphaServer 8400

V97-2.1—24 Jul 1997

DIGITAL Systems and Options Catalog

Product Description

The AlphaServer 8400—using the world's fastest microprocessors, the Alpha 21164 300 MHz or 440 MHz CPUs—is the world's fastest and highest capacity enterprise server. It is the solution for the most demanding business problems.

ServerWORKS Manager provides advanced server and network management capabilities and is supplied with all AlphaServer systems. SNMP (Simple Network Management Protocol) enables information to pass from the managed system to the console for Digital UNIX, Windows NT, and OpenVMS for AlphaServers. Using ServerWORKS, the system manager can build and view topological maps of the network. Detailed server information is viewable, including system, network, storage, and environmental information. All AlphaServer systems are also supplied with management tools to complement ServerWORKS Manager. These include StorageWorks Command Console for storage management. For more information, see the "StorageWorks Software" section of this catalog.

The AlphaServer 8400 5/300 supports up to 12 processors with 8 GB memory, two processors with 28 GB of memory, and any combination between these maximums, with 1.2 GB/sec (peak) of I/O.

The AlphaServer 8400 5/440 supports up to 14 processors with 4 GB memory, two processors with 28 GB of memory, and any combination between these maximums, with 1.2 GB/sec (peak) of I/O.

The AlphaServer 8400 supports the DIGITAL UNIX and OpenVMS operating systems. For investment protection, DEC and VAX 7000 products can be upgraded to the AlphaServer 8400 in a few hours. The AlphaServer 8400 platform is designed to take full advantage of future generations of Alpha microprocessors.

The AlphaServer 8400 enterprise servers join the AlphaServer line, with high performance PCI I/O, providing up to 144 PCI slots on 12 different physical PCI buses. The AlphaServer 8400 includes a one year hardware warranty, on-site, 4 hour response, five days per week. System installation is included with the AlphaServer 8400 5/440 system.

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Step 1—Base Systems

- AlphaServer 8400 5/300 Systems require
 - DIGITAL UNIX V3.2B or later, and OpenVMS V6.2 or later
- AlphaServer 8400 5/440 Systems require
 - DIGITAL UNIX V3.2G or DIGITAL UNIX V4.0A, or OpenVMS V6.2-1H3 or V7.1
- Software media and documentation required for first system on site. See Step 13 for ordering information.
- Console terminal required to install system. See Step 11 unless terminal is available on site.
- System includes 9 slot centerplane—three slots used by the CPU module, memory module, and system I/O module (KFTIA-AA).
 - Six slots available for additional CPU, memory, or system I/O module(s).
- CD-ROM connected via single-ended SCSI-2 port on KFTIA-AA system I/O module.
- 2 GB or 4.3 GB SCSI system disk drive and DWZZB-VW are located in BA660-AB StorageWorks shelf and connected via Fast Wide Differential (FWD) port on KFTIA-AA system I/O module, using one CK-KFTIA-AA.
- For recommended power protection see section after system specifications. UPS Power Management Software is included in ServerWORKS Manager kit. Software communicates with recommended UPS.

AlphaServer 8400 Base Servers include

- Processor module with two Alpha microprocessor 21164 5/300 MHz or 5/440 MHz CPUs; each CPU includes 4 MB back-up cache
- System I/O module (KFTIA-AA) includes
 - I/O channel
 - Two twisted-pair 802.3/Ethernets
 - Single-ended SCSI-2 port
 - Three Fast Wide Differential (FWD) SCSI-2 ports
- Three CK-KFTIA-AA cabinet kits
- 256 MB, 512 MB, 2 GB or 4 GB of memory
- BA660-AB StorageWorks Plug-in-unit (PIU)
- 2 GB or 4.3 GB 3.5" SCSI system disk drive
- 600 MB CD-ROM drive
- DWZZB-VW SCSI signal converter
- Three-Phase Power Subsystem with power cord
- One H7263-AC or H7263-AD non-BBU capable 48 VDC power regulator
- Shielded console cable is included for connection to the console terminal
- Factory Installed Software
- 5/300 Operating System Software
 - DIGITAL UNIX base license, DIGITAL NAS Base Server 200 software, **or**
 - OpenVMS base license, DIGITAL NAS Base Server 200 software
- 5/440 Operating System Software
 - DIGITAL UNIX base license, Unlimited User license, Server Extension license, Internet Access Software license, **or**
 - OpenVMS base license, DIGITAL Enterprise Integration Package (EIP).
- One year hardware product warranty
- 90 day software product warranty
- System installation included with AlphaServer 8400 5/440 Base Servers

5/300 Dual-CPU systems	Operating System	Power	Memory
DA-291BC-BA/BB/BC	DIGITAL UNIX	Three Phase	256 MB
DA-291BD-BA/BB/BC	DIGITAL UNIX	Three Phase	512 MB
DA-291BF-DA/DB/DC	DIGITAL UNIX	Three Phase	2 GB
DY-291BC-BA/BB/BC	OpenVMS	Three Phase	256 MB
DY-291BD-BA/BB/BC	OpenVMS	Three Phase	512 MB
DY-291BF-DA/DB/DC	OpenVMS	Three Phase	2 GB
5/440 Dual-CPU systems	Operating System	Power	Memory
DA-292FF-CA/CB/CC	DIGITAL UNIX	Three Phase	2 GB
DA-292FG-CA/CB/CC	DIGITAL UNIX	Three Phase	4 GB
DY-292FF-CA/CB/CC	OpenVMS	Three Phase	2 GB
DY-292FG-CA/CB/CC	OpenVMS	Three Phase	4 GB

Note: xA = 60 Hz, 208 V, xB = 50 Hz, 380/416 V, xC = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

Step 1—Base Systems (*continued*)

AlphaServer 8400 Expanded Base Servers include:

- .. Processor module with
 - Two Alpha microprocessor 21164 5/300 MHz or 5/440 MHz CPUs; each CPU includes 4-MB Backup cache
- .. System I/O module with four I/O channels (KFTHA-AA)
- .. 512 MB, 2 GB or 4 GB of memory
- .. BA660-AB StorageWorks Plug-in-unit
- .. 2 GB or 4.3 GB 3.5" SCSI system disk drive
- .. BN21K-02 2-meter SCSI cable(s)
 - Two with 5/300 systems
 - One with 5/440 systems
- .. DWZZB-VW SCSI signal converter(s)
 - Two with 5/300 systems
 - One with 5/440 systems
- .. 600 MB CD-ROM drive
- .. PCI 12 slot Plug-in-unit(s)
 - One DWLPB-AA and one DWLPB-BA with 5/300 systems
 - One DWLPB-AA with 5/440 systems
- .. PCI Fast Wide Differential SCSI controller(s)
 - Eight KZPSA-BBs with 5/300 DIGITAL UNIX systems
 - Seven KZPSA-BBs with 5/300 OpenVMS systems
 - One KZPSA-BB with 5/440 systems
- .. PCI Fast Narrow Single-Ended SCSI controller KZPAA-AA for CD-ROM connection only
- .. DIGITAL Etherworks 32-bit Network Interface Card
- .. BN21H-02 2-meter SCSI cable
- .. Two H7263-AC or H7263-AD non-BBU capable 48 VDC power regulators
 - Three-Phase power subsystem **includes** power cord
- .. Shielded console cable for connection to console terminal
- .. Factory Installed Software
- .. 5/300 Operating System Software
 - DIGITAL UNIX base license, DIGITAL NAS Base Server 200 software, **or**
 - OpenVMS base license, DIGITAL NAS Base Server 200 software
- .. 5/440 Operating System Software
 - DIGITAL UNIX base license, Unlimited User license, Server Extension license, Internet Access Software license, **or**
 - OpenVMS base license, DIGITAL Enterprise Integration Package (EIP).
- .. One year hardware product warranty
- .. 90 day software product warranty
- .. System installation included with AlphaServer 8400 5/440 Expanded Base Servers

5/300 Dual-CPU systems	Operating System	Power	Memory
DA-291BD-CA/CB/CC	DIGITAL UNIX	Three Phase	512 MB
DA-291BF-HA/HB/HC	DIGITAL UNIX	Three Phase	2 GB
DY-291BD-CA/CB/CC	OpenVMS	Three Phase	512 MB
DY-291BF-HA/HB/HC	OpenVMS	Three Phase	2 GB
5/440 Dual-CPU systems	Operating System	Power	Memory
DA-292FF-DA/DB/DC	DIGITAL UNIX	Three Phase	2 GB
DA-292FG-DA/DB/DC	DIGITAL UNIX	Three Phase	4 GB
DY-292FF-DA/DB/DC	OpenVMS	Three Phase	2 GB
DY-292FG-DA/DB/DC	OpenVMS	Three Phase	4 GB

Note: xA = 60 Hz, 208 V, xB = 50 Hz, 380/416 V, xC = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

Step 1a—5/300 System Building Blocks

System Building Blocks are an alternative to standard Base Servers, or Expanded Base Servers. They provide flexibility in configuring the AlphaServer 8400 with a choice of memory and I/O options.

System Building Block Requirements:

- .. Minimum of one Memory module
- .. Minimum of one I/O module
- .. CD-ROM Drive
- .. Systems require DIGITAL UNIX V3.2B or later, and OpenVMS V6.2 or later.
- .. Console terminal required unless available on site.
- .. System consists of 9 slot backplane—three slots used by CPU, memory, and system I/O modules.
 - Six slots available for additional CPU, memory, or system I/O module(s).
- .. If KFTHA-AA I/O module is selected the following PCI or XMI options must be ordered to provide the interface to CD-ROM drive.

Required for PCI systems

- DWLPB-AA** PCI plug-in unit. See Step 5 for details.
- KZPAA-AA** PCI single-ended SCSI controller for CD-ROM connection only; KZPAA is restricted as CD-ROM connection only, no other disk or tape connections are supported—maximum one per system.
- BN21H-02** SCSI cable

Required for XMI systems

- DWLMA-AA** XMI plug-in unit. See Step 6 for details.
- KZMSA-AB** XMI single-ended SCSI controller
- BN21H-02** SCSI cable

- .. CD-ROM, 600 MB 5.25" in cabinet drive (**RRDCD-CA**) is required and **must** be ordered separately.
- .. If Factory Installed Software is required, BA660-AB, appropriate disk drive, and controller **must** be ordered separately.
- .. Redundant power supply (N+1) can be added if required.

AlphaServer 8400 5/300 System Building Blocks

- .. Processor module with Two Alpha microprocessor
21164 5/300 MHz CPU(s), each CPU includes 4 MB
Backup cache
- .. Three-Phase Power Subsystem with power cord
- .. 48 VDC power regulator
- .. DIGITAL UNIX base license, **or**
- .. OpenVMS base license
- .. DIGITAL NAS Base Server 200 software
- .. One year hardware product warranty
- .. 90 day software product warranty

Dual-CPU systems	Operating System	Power	Memory	I/O Module
DA-291BY-AA/AB/AC	DIGITAL UNIX	Three Phase	Required	Required
DY-291BY-AA/AB/AC	OpenVMS	Three Phase	Required	Required

Note: xA = 60 Hz, 208 V, xB = 50 Hz, 380/416 V, xC = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

Step 1b—AlphaServer Expansion Packages

AlphaServer Expansion Packages are designed to be added to Base AlphaServers, Expanded Base Servers, and System Building Blocks to create fully functional CI cluster add-on systems. They include all the necessary hardware (excluding console terminal) and software to provide complete and operational systems.

Note: These packages are only orderable with a system configuration. They are not orderable as stand alone, upgrade options or spared on the order.

OpenVMS AlphaServer Expansion Package

8YCAA-AX **Cluster Add-on Package** includes:
 DWLMA-AA XMI plug-in unit
 CIXCD-AC XMI CI controller
 One BNCIA 10-meter cable
 OpenVMS cluster License (QL-MUZAQ-AA)

Step 2—Additional CPU Modules (SMP Upgrades)

- .. 5/300 MHz systems support a maximum of 6 processor modules (total of 12 CPUs)
- .. 5/440 MHz systems support a maximum of 7 processor modules (total of 14 CPUs) under UNIX V3.2G and V4.0B or OpenVMS V6.2-1H3 and V7.1. Requires console V4.8-6 or later firmware and DECevent V2.3 plus patch files included in the QZ-00RAA-T8 kit.
- .. Combining 5/300, 5/350, or 5/440 MHz CPU modules in same system is **not** supported.
- .. For more than three processor modules in a system, a minimum of two separate memory modules are recommended for optimal system performance.
- .. All SMP upgrades include processor module with Alpha microprocessor(s) SMP license, and end-user product warranty.

5/300 Servers	5/350 Servers	5/440 Servers	CPU Module Type	Operating System
751P2-AX	753P2-AX	N/A	Single-CPU	DIGITAL UNIX
752P2-AX	754P2-AX	756P2-AX	Dual-CPU	DIGITAL UNIX
751P1-AX		N/A	Single-CPU	OpenVMS
752P1-AX	754P1-AX	756P1-AX	Dual-CPU	OpenVMS

Step 3—Memory

- .. Maximum of 28 GB of memory supported on 5/300 MHz CPUs Rev H07, H08, H09, P08, P09, P10, and all 5/350 and 5/440 MHz CPUs.
- .. For Base Servers or Expanded Base Servers order up to six additional memory modules—system maximum seven.
- .. System Building Blocks require the selection of one memory module—system maximum seven.
- .. Maximum of seven memory modules is reduced by one for each additional CPU module added from Step 3 and each additional System I/O module added from Step 5.
- .. Memory modules
 - 128 MB through 2 GB memory modules have built in two-way interleaving; additional interleaving is accomplished by adding more memory modules
 - 4 GB memory modules have built in four-way interleaving. Best performance is achieved when two 2 GB modules are paired with one 4 GB module. This set (2 x 2 GB and 1 x 4 GB) can be paired with another 8 GB memory set for a maximum of 16-way memory interleaving.

MS7CC-BA 128 MB memory module
MS7CC-CA 256 MB memory module
MS7CC-DA 512 MB memory module
MS7CC-EA 1073 MB memory module
MS7CC-FA 2147 MB memory module
MS7CC-GA¹ 4294 MB memory module

1. Supported on 5/300 MHz CPUs Rev H07, H08, H09, P08, P09, P10, and all 5/350 and 5/440 MHz CPUs.

Step 3a—Memory Upgrades

- .. Memory upgrades are field installed only (not configured in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs); upgrades 128 MB (-BA) module to 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs); upgrades 512 MB (-DA) module to 1 GB (-EA) module

Step 3b—Prestoserve Non-Volatile Random Access Memory (NVRAM)

- .. Supported on DIGITAL UNIX systems only.
- .. Maximum one Prestoserve I/O performance enhancement option per system.
- .. Includes Prestoserve license and documentation kit.

DJ-ML200-BA	4 MB Prestoserve; PCI option—requires DWLPB-AA/BA
DJ-ML200-CA	8 MB Prestoserve; PCI option—requires DWLPB-AA/BA
DJ-ML300-BA	4 MB Prestoserve; KFTIA-AA daughter card mounting, requires KFTIA-AA

Step 4—I/O Expansion Buses

PCI and XMI I/O expansion buses are available on AlphaServer 8400 systems. Application and system configuration determines maximum I/O configuration. Configuration limits exist at I/O bus level and controller level. With different I/O buses present in the system, verify maximum number of allowed controllers listed in the Controller Configuration Table.

- .. Each DWLPB-AA/AB (PCI plug-in unit) includes a 12-slot PCI bus and uses one rear expansion bay. SCSI disks in BA660-AB plug-in units can occupy the corresponding front expansion bay.
- .. Each DWLPB-AA/AB (PCI plug-in unit) has one open space for addition of DWLPB-BA/BB (second PCI expansion box) or BA661-AA (Wide SCSI StorageWorks shelf)
- .. Each DWLMA-AA/BA (XMI plug-in unit) includes one 12-slot XMI channel—uses two expansion bays, front and back.
- .. Each PCI and XMI plug-in unit requires one I/O channel connection to either KFTHA-AA or KFTIA-AA, see Step 6.
- .. Maximum of twelve I/O channels supported (three KFTHAs).

DWLPB-AA	PCI plug-in unit with one PCI box for AlphaServer 8400 system cabinet only, maximum two per system cabinet, two per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLPB-AB	PCI plug-in unit with one PCI box for AlphaServer 8400 expansion cabinet only, maximum two per expansion cabinet, four per system. Maximum of six DWLPB-AA and DWLPB-AB (PCI plug-in units) per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLPB-BA	Second PCI expansion box for mounting in DWLPB-AA —maximum one per DWLPB-AA. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLPB-BB	Second PCI expansion box for mounting in DWLPB-AB —maximum one per DWLPB-AB. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
BA661-AA	Wide SCSI StorageWorks Shelf (BA356-LB) can be added to DWLPB-AA/AB in place of second PCI expansion box (DWLPB-BA/BB). Maximum one BA661-AA per DWLPB-AA/AB, and maximum of six BA661-AA per system. Supports 16-bit (Wide) SCSI and some 8-bit (Narrow) SCSI devices.
KFE70-AA	EISA Bridge option —PCI to EISA bridge module set—must reside in first DWLPB-AA in system cabinet only. Converts PCI bus from 12-slot bus to 2 EISA, 6 PCI/EISA, and 2 PCI slots. Includes RX26 floppy drive, mounting hardware, and cables to mount RX26 below CD-ROM in the system cabinet. Maximum of one EISA Bridge option per system. This option is required to support KZPSC SCSI RAID controllers. It includes the floppy disk drive required to run the RAID Configuration Utility (RCU).
DWLMA-AA	XMI plug-in unit for system cabinet —maximum two per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLMA-BA	XMI plug-in unit for I/O expansion cabinet —maximum two per cabinet, four per system. Total maximum six DWLMA-AA and DWLMA-BA (XMI plug-in units) per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.

Step 5—System I/O Modules

- .. KFTIA-AA system I/O module included with Base Server; KFTHA-AA included with Expanded Base Server—any combination of KFTIA or KFTHA modules can be added for a maximum of three.
 - Maximum twelve I/O channels available on AlphaServer 8400.
- .. System Building Block requires the selection of one I/O module.

KFTHA-AA	System I/O module with four I/O channels for PCI or XMI plug-in units
KFTIA-AA	System I/O module with one I/O channel for PCI or XMI plug-in units. Includes <ul style="list-style-type: none"> - two 802.3 twisted-pair Ethernet ports—requires BN26M cable per port - single-ended SCSI-2 port—requires BN21H cable - three FWD (Fast Wide Differential) SCSI-2 ports—requires CK-KFTIA-AA and BN21K cable per port One of the following optional FDDI daughter cards can be added to KFTIA-AA—see Step 8 for cables. <ul style="list-style-type: none"> - Single attachment station multi-mode fiber card (DEFPZ-AA) or - Twisted-pair copper card (DEFPZ-UA) Prestoserve (DJ-ML300-BA) can be added to KFTIA-AA
BN26M-xx	Ethernet twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable.
BN21H-xx	SCSI-2 Single-ended cable; 50-pin male straight to 50-pin male straight. Connects KFTIA-AA single-ended SCSI-2 port to StorageWorks shelf.
CK-KFTIA-AA	Cabinet kit for FWD (Fast Wide Differential) SCSI-2 port. One kit required for each used port on KFTIA-AA, maximum three per KFTIA-AA. Cabinet kit includes Y-cable and FWD terminator.
BN21K-xx	SCSI-2 Fast Wide Differential cables; 68-pin male straight to 68-pin male right-angle. Connects KFTIA-AA Fast Wide Differential SCSI-2 ports to DWZZA-VA or DWZZB-VW.
BN21K-02*	Connects from KFTIA FWD port to DWZZB-VW in BA660-AB System cabinet (rear) Connects from KFTIA FWD port to DWZZB-VW in BA661-AA in DWLPB-xx PIU
BN21K-03*	Connects from KFTIA FWD port to DWZZB-VW in BA660-AB System cabinet (front)
BN21K-05/10	Connects from KFTIA FWD port to DWZZB-VW in BA660-AB Expansion cabinet (front or rear) Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in SW500 and SW800 Cabinets

* Manufacturing may substitute correct cable length depending on configuration.

Step 6—Storage Controllers

- .. KFTIA-AA included with each Base Server; KFTHA-AA included with Expanded Base Server—PCI, EISA, and XMI storage controllers can be added.
 - Requires corresponding PCI plug-in unit (DWLPB-AA/AB/BA/BB) or XMI plug-in unit (DWLMA-AA/BA).
- .. DWZZA-AA requires minimum revision E02 for connecting any Fast Wide Differential SCSI-2 port from KFTIA-AA or KZPSA-BB to TZ8xx tape loaders.
- .. DWZZB-VW Fast Wide Differential Single-ended SCSI Converter requires minimum revision A01 for connecting FWD SCSI-2 signals from KFTIA-AA or KZPSA-BB to BA356-JB StorageWorks Shelf.
- .. System maximum of four KZPSC or KZPAC SCSI RAID controllers.
- .. Tape and optical devices are not supported on KZPSC or KZPAC SCSI RAID controllers.

PCI-based Storage Controllers

KZPSA-BB	PCI Fast Wide Differential SCSI Adapter —OpenVMS V6.2-1H3 supports eight per PCI, maximum 26 per system. DIGITAL UNIX supports eight per PCI, maximum 32 per system (uses one PCI slot). Provides one SCSI-2 bus. KZPSA supports DECsafe Available Server.
BN21K-xx	SCSI-2 Fast Wide Differential cables—68-pin male straight to 68-pin male right-angle. Connects KZPSA-BB Fast Wide Differential SCSI-2 port to DWZZA-VA or DWZZB-VW.
BN21K-01*	Connects from KZPSA to DWZZB-VW in BA660-AB System cabinet (rear) Connects from KZPSA to DWZZB-VW in BA661-AA in DWLPB-xx PIU
BN21K-02*	Connects from KZPSA to DWZZB-VW in BA660-AB System cabinet (front)
BN21K-05/10	Connects from KZPSA to DWZZB-VW in BA660-AB Expansion cabinet (front or rear)

Step 6—Storage Controllers (*continued*)
PCI-based Storage Controllers

KZPAC-AA	PCI one-port SCSI RAID Controller with 4 MB cache memory —Uses one PCI slot. Provides one fast/wide single-ended connection. Allows RAID levels 0, 1 and 5. Includes RAID Array 230/plus subsystem software and documentation kit. KFE70-AA EISA Bridge option required. Tape and optical drives not supported. Maximum of 4 per PCI, maximum of 4 per system supported with DIGITAL UNIX V3.2G or V4.0B; OpenVMS V6.2-1H3 or v7.1.
KZPAC-CA	PCI three-port SCSI RAID Controller with 4MB cache memory —Uses two PCI slots. Provides three fast wide/single-ended connections. Allows RAID levels 0, 1 and 5. Includes RAID/Array 230/plus subsystem software and documentation kit. KFE70-AA EISA Bridge option required. Tape and optical drives not supported. Maximum of four per PCI, maximum of four per system if third port not used (otherwise maximum of three per PCI, three per system) supported with DIGITAL UNIX V3.2G or V4.0B; OpenVMS V6.2-1H3 or V7.1. Order BN31K-0E or KZPAC-SB for third port connection.
KZPAC-CB	PCI three-port SCSI RAID Controller with 8MB cache memory —Uses two PCI slots. Provides three fast wide/single-ended connections. Allows RAID levels 0, 1 and 5. Includes RAID/Array 230/plus subsystem software and documentation kit. KFE70-AA EISA Bridge option required. Tape and optical drives not supported. Maximum of four per PCI, maximum of four per system if third port not used (otherwise maximum of three per PCI, three per system) supported with DIGITAL UNIX V3.2G or V4.0B; OpenVMS V6.2-1H3 or V7.1. Order BN31K-0E or KZPAC-SB for third port connection.
BN31S-1E	1.5 meter wide single-ended SCSI cable for connections from PCI RAID controller to BA660-AB system cabinet (in front and rear locations) and BA661-AA. One required for each used port on KZPSC-BA or KZPAC-CA/CB module.
BN31K-0E	Required for KZPSC-BA or KZPAC-CA/CB to use third port on module. Connects internally from KZPSC-BA module to second PCI slot/bulkhead.
KZPAC-SB	SCSI cable/bulkhead assembly kit with two ports for KZPSC-BA or KZPAC-CA/CB, allows connection of two third-port outputs using one PCI bulkhead slot.
BN31S-02	2.0 meter wide single-ended SCSI cable for connections from PCI RAID controller to BA660-AB system cabinet and BA661-AA.
KZPSC-UB	Battery back-up for cache memory option for KZPAC or KZPSC controller.
MS100-BB	8 MB cache memory option; upgrades KZPAC-CA to KZPAC-CB, field installable only.
KZPSC-AA	PCI one-port SCSI RAID Controller —OpenVMS and DIGITAL UNIX support four per PCI, maximum four per system (uses one PCI slot). KFE70-AA EISA Bridge option required. Provides one fast/wide/single-ended connection. Allows RAID levels 0, 1, and 5. Tape drives are not supported.
KZPSC-BA	PCI SCSI RAID Controller with three ports —OpenVMS and DIGITAL UNIX support four per PCI, maximum four per system (uses two PCI slots). KFE70-AA EISA Bridge option required. Provides three Fast Wide/single-ended connections. Allows RAID levels 0,1, and 5. Tape drives not supported. Order BN31K-0E or KZPAC-SB for third port connection.
BN31S-1E	1.5 meter wide single-ended SCSI cable for connections from PCI RAID controller to BA660-AB system cabinet (in front and rear locations) and BA661-AA. One required for each used port on KZPSC-BA or KZPAC-CA/CB module.
BN31K-0E	Required for KZPSC-BA or KZPAC-CA/CB to use third port on module. Connects internally from KZPSC-BA or KZPAC-CA/CB module to second PCI slot/bulkhead.
KZPAC-SB	SCSI cable/bulkhead assembly kit with two ports for KZPSC-BA or KZPAC-CA/CB, allows connection of two third-port outputs using one PCI bulkhead slot.
BN31S-02	2.0 meter wide single-ended SCSI cable for connections from PCI RAID controller to BA660-AB system cabinet and BA661-AA.
KZPSC-UB	Battery back-up for cache memory option for KZPAC or KZPSC controller.
MS100-AA†	16 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only.
MS100-AB†	32 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only.
KFPSA-AA	PCI DSSI Adapter (OpenVMS only) —Requires OpenVMS V6.2-1H2 or later; minimum System Console Firmware Revision 3.09. Maximum twelve per PCI, 24 per system with OpenVMS V6.2-1H3. (End node only) Note: KFPSA and KFMSB not supported on the same bus.
BC21Q-xx	External shielded cable (MR/MR connectors) Select required length—09, 16, 25, 50 ft
BC22Q-xx	External shielded cable (MR/PS connectors) Select required length—16, 25, 50 ft

† Requires AlphaServer 8400 minimum System Console Firmware Revision V3.2.2, OpenVMS V6.2-1H2 and DIGITAL UNIX V3.2D or later operating system software.

Step 6—Storage Controllers (*continued*)

CIPCA-AA	PCI-to-CI Adapter (OpenVMS only) —Requires OpenVMS V6.2-1H3 or V7.1, minimum System Console Firmware Revision 4.0-4. Maximum four per PCI, 26 per system running OpenVMS V7.1. Uses one PCI slot for adapter and one EISA slot for power only. Note: KFE70 option is not required.
CIPCA-BA	Same as above except uses two PCI slots
BNCIA-xx	Computer interconnect cable sets—Connects CIPCA to Star Coupler. Select required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft)

Note: For OpenVMS systems with greater than 1 GB of memory, the following TIMA patch kits are required to support KZPAC options: V 6.2 kit-ALPDRIV04_062; V7.1 kit-ALPDRIV01_071.

XMI-based Storage Controllers

KZMSA-AB	Fast single-ended SCSI-2 Disk/Tape Adapter —OpenVMS supports six per XMI, maximum 12 per system. DIGITAL UNIX supports 10 per XMI, maximum 16 per system (uses one XMI slot). Provides two single-ended SCSI-2 buses. KZMSA supports DECsafe Available Server.
CK-KZMSA-LA	Two 30" internal cabinet cables—One kit per KZMSA required.
CIXCD-AC	XMI CI Controller —OpenVMS supports four per XMI, maximum 10 per system. DIGITAL UNIX supports one per XMI, maximum one per system (uses one XMI slot). The CIXCD requires one BNCIA cable set to connect system to Star Coupler. OpenVMS Cluster software license required for each system when multiple OpenVMS systems are used in cluster environment. Note: One CIXCD is supported on DIGITAL UNIX systems for expanded disk interconnect capability only.
BNCIA-xx	Computer interconnect cable sets—Connects Star Coupler to system and SW800. Select required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).

Step 6a—Non-Backplane External Storage Controllers

- .. HSZ50 family of SCSI Storage Array Controllers are supported under DIGITAL UNIX V3.2G and V4.0A and OpenVMS V6.2-1H3. A DIGITAL UNIX patch OSF405-034 is required for dual redundant failover.
 - .. HSJ50 family of CI Storage Array Controllers are supported under OpenVMS V6.2-1H3 with CIPCA-AA/BA or CIXCD-AC CI controllers. QB-5C4AA-SA software kits are required for each external cache (1 for HSJ50, 2 for HSJ52, 4 for HSJ54).
 - .. HSD50 family of DSSI Storage Array Controllers are supported under OpenVMS V6.2-1H3 with minimum SRM console version V4.1-6.
 - Controllers require KZPSA, KZMSA, KFPSA, CIXCD or CIPCA SCSI adapters or controllers, as appropriate.
 - HSZ50-Ax requires one QB-5CJAA-SA kit.
 - HSZ52-Ax requires two QB-5CJAA-SA kits.
 - HSZ54-AJ requires four QB-5CJAA-SA kits.
- | | |
|-----------------|---|
| HSZ50-AF | StorageWorks RAID Array 450/HSZ50 32 MB SCSI controller, 6 SCSI channels, 36 SCSI-2 device connections, 32 LUN maximum, 32 MB cache module, single external cache battery system building block. |
| HSZ50-AH | StorageWorks RAID Array 450/HSZ50 64 MB SCSI controller, 6 SCSI channels, 36 SCSI-2 device connections, 32 LUN maximum, 64 MB cache module, single external cache battery system building block. |
| HSZ50-AJ | StorageWorks RAID Array 450/HSZ50 128 MB SCSI controller, 6 SCSI channels, 36 dual, 42 single SCSI-two-device connections, 32 LUN maximum, 128 MB cache module, single external cache battery system building block. |
| HSZ52-AF | StorageWorks RAID Array 450/HSZ50 64 MB dual SCSI controllers, 12 SCSI channels, 36 SCSI-two-device connections, 32 LUN maximum, two cache modules, one dual external cache battery system building block, two external cache batteries, two 2-meter cables. |
| HSZ52-AH | StorageWorks RAID Array 450/HSZ50 128 MB dual SCSI controllers, 12 SCSI channels, 36 SCSI-two-device connections, 32 LUN maximum, two cache modules, one dual external cache battery system building block, two external cache batteries, two 2-meter cables. |
| HSZ52-AJ | StorageWorks RAID Array 450/HSZ50 256 MB dual SCSI controllers, 12 SCSI channels, 36 SCSI-two-device connections, 32 LUN maximum, two cache modules, one dual external cache battery system building block, two external cache batteries, two 2-meter cables. |

Step 6a—Non-Backplane External Storage Controllers (*continued*)

HSZ54-AJ	StorageWorks RAID Array 450/HSZ50 512 MB quad SCSI controllers, 12 SCSI channels, 72 SCSI-two-device connections, 64 LUN maximum, four cache modules, two dual external cache battery system building blocks, four external cache batteries, four 2-meter cables.
HSJ50-AF	32 MB Cache 6 channel CI array controller with cache battery
HSJ50-AH	64 MB Cache 6 channel CI array controller with cache battery
HSJ50-AJ	128 MB Cache 6 channel CI array controller with cache battery
HSJ52-AF	Dual 64 MB Cache CI array controller with cache batteries
HSJ52-AH	Dual 128 MB Cache CI array controller with cache batteries
HSJ52-AJ	Dual 256 MB Cache CI array controller with cache batteries
HSJ54-AJ	Quad 512 MB Cache CI array controller with cache batteries
HSD50-AF	DSSI Controller, 6 channel, 64MB cache & external cache battery
HSD50-AH	DSSI Controller, 6 channel, 32MB cache & external cache battery
HSD50-AJ	DSSI Controller, 6 channel, 128MB cache & external cache battery
HSD52-AF	Two DSSI Controllers with 32 MB cache with battery
HSD52-AH	Two DSSI Controllers with 64 MB cache with battery
HSD52-AJ	Two DSSI Controllers with 128 MB cache with battery

Step 7—Storage

Note: When multiple storage devices are configured with the system, specify which devices should be installed inside the system cabinet, inside the system expansion cabinet, or installed in the external StorageWorks cabinet. Line item sequencing allows Manufacturing to configure storage options in the appropriate cabinet.

- List storage options to be integrated in system cabinet immediately following the system part number.
- List storage options to be integrated in StorageWorks cabinet immediately following StorageWorks cabinet part number.
- Order the appropriate BN21*-* SCSI cables for connecting controllers and SCSI storage options.
- .. Wide SCSI devices are supported in BA660-AB/BA661-AA StorageWorks PIUs, or external StorageWorks cabinets. BA660-AB/BA661-AA support both wide and narrow SCSI 5400 RPM and 7200 RPM disk drives.
- .. System cabinet provides space for four disk plug-in units (PIU) if no PCI or XMI plug-in units are installed. Each of the two pairs of expansion bays (front to back) in bottom of system cabinet can hold one Battery PIU, one XMI PIU, one PCI PIU, one PCI PIU plus one SCSI disk PIU, one SCSI disk PIU, or two SCSI disk PIUs.
- .. System cabinet provides space for up to seven StorageWorks shelves—three BA660-AB plug-in-units (each includes two StorageWorks shelves) and one BA661-AA StorageWorks shelf. Each shelf holds a maximum of two 5.25" devices and one 3.5" device or seven 3.5" devices. Typical configurations will require a signal converter, i.e., DWZZB-VW which counts as one 3.5" device.

Wide SCSI Options

- .. StorageWorks shelves (BA356-xx) are normally configured in single bus mode (seven SCSI devices per shelf). To configure BA356-xx shelf in split-bus mode the following options are required:
 - Split-bus terminator (BA35X-ME)
 - SCSI controller for each active SCSI port
 - SCSI cables to connect each controller to BA356-xx shelf

BA660-AB *	Wide SCSI-2 StorageWorks plug-in-unit —includes two BA356-LB modular expansion shelves, 16-bit I/O personality module, 48V/150W DC power supply, DC fans, and AlphaServer 8400 mounting hardware. Supports 16-bit wide SCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum hardware revision levels.
BA661-AA *	Wide SCSI-2 StorageWorks Shelf —includes 16-bit I/O personality module, 48V/150W DC power supply, DC fans, mounting hardware and BA356-LB. Can be added to DWLPB-AA/AB in place of second PCI expansion box (DWLPB-BA/BB). Maximum one BA661-AA per DWLPB-AA/AB; maximum six BA661-AA per system. Supports 16-bit (wide) SCSI and some 8-bit (narrow) SCSI devices.
DWZZB-VW	Wide SCSI-2 StorageWorks Signal Converter —required to convert FWD signals from KFTIA-AA and KZPSA-BB for use in BA660-AB and BA661-AA/BA.

Step 7—Storage (*continued*)**Wide SCSI Options (*continued*)**

BA35X-MG 8-bit I/O Personality Module—can be used in place of 16-bit I/O personality module for direct connection to narrow single-ended controllers, field installable only.

Note: BA35X-ME terminators must be ordered separately to split a BA356 bus.

16-bit Disk Drives

DS-RZ28M-VZ	2.1 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5" carrier supported under OpenVMS V6.2-1H3 and UNIX V3.2G
DS-RZ1BB-VW	2.1 GB 7200 RPM 16-bit Wide disk drive
RZ29B-VW	4.3 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5" carrier
DS-RZ1CB-VW	4.3 GB 7200 RPM 16-bit Wide disk drive
DS-RZ1DB-VW	9.0 GB 7200 RPM 16-bit Wide disk drive

Note: To ensure 16-bit wide SCSI operation, use wide SCSI drives with wide SCSI controllers in wide SCSI StorageWorks shelves with wide SCSI cables. See Storage Devices—StorageWorks Supported Devices for 8-bit and 16-bit Expansion Table for minimum hardware revision levels.

The DS-RZ1xB-VW disk drives are not supported in a BA356 shelf on the same SCSI bus with 5.25" devices. The minimum operating system version tested includes OpenVMS V6.2-1H3 and DIGITAL UNIX V4.0B.

8-bit Disk Drives

DS-RZ28M-VZ	2.1 GB 5400 RPM 8-bit Narrow SCSI disk drive
DS-RZ28L-VA	2.1 GB 7200 RPM 8-bit Narrow SCSI disk drive
DS-RZ29L-VA	4.3 GB 7200 RPM 8-bit Narrow SCSI disk drive
DS-RZ40-VA	9.0 GB 7200 RPM 8-bit Narrow SCSI disk drive

Tape Devices

TLZ09-VA	8.0 GB DAT 3.5" SCSI tape drive in StorageWorks carrier. OpenVMS V6.2-1H3 and DIGITAL UNIX V3.2C required along with System Console Firmware Revision 3.0-9.
TLZ9L -VA	32/64 GB DAT tape loader in StorageWorks carrier
TKZ9E -VA	2/5/7/10/14 GB 8 mm helical scan tape drive in 5.25" StorageWorks carrier
TZ87-VA	20.0 GB DLT 5.25" SCSI tape drive in StorageWorks carrier; must be mounted in BA660-AB located in rear of cabinet or BA661-AA located in DWLPB-xx.
TZ88N-VA	20/40 GB DLT 5.25" SCSI tape drive in StorageWorks carrier
TZ89N-VA	35/70 GB DLT 5.25" SCSI tape drive in StorageWorks carrier

Solid State Disks

.. Supported with KZMSA, KZPSC, KZPSA, KFTIA—cannot be combined with RZxx disks/tapes on same SCSI bus

EZ31-VW	134 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later
EZ32-VW	268 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later
EZ64-VA/VW	475 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later
EZ69-VA/VW	950 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later

Step 7a—StorageWorks Expansion Packages

StorageWorks Expansion Packages have been created to simplify ordering StorageWorks options. They are intended to be used with Expanded Base Servers.

- .. Order the correct number of HSZ40-TL packages to fill the BA350-MB RAID controller shelves in the SW82x StorageWorks Cabinet package.
- .. Order disk drives separately

Step 7a—StorageWorks Expansion Packages (continued)

- .. SW820/SW821 StorageWorks Expansion Packages—all BA356 shelves operate in split-bus mode.
- .. All SW82x StorageWorks Expansion Packages include redundant power supplies (BA35X-HF)—this reduces the number of available slots in each BA356 shelf to six in the SW822 and three on each split-bus of the SW820/SW821.

StorageWorks Expansion Packages

SW820-LA/LB	SW800 StorageWorks Cabinet with five BA350-MB RAID controller shelves, 15 BA356-JC device shelves, 15 BA35X-MG 8-bit I/O personality modules for BA356, 30 BN21H02 SCSI-2 single-ended cables, 20 BA35X-HF redundant power supplies, 15 BA35X-ME terminator boards— split-bus mode
SW821-LA/LB	SW800 StorageWorks Cabinet with seven BA350-MB RAID controller shelves, 14 BA356-JC device shelves, 14 BA35X-MG 8-bit I/O personality modules for BA356, 28 BN21H02 SCSI-2 single-ended cables, 21 BA35X-HF redundant power supplies, 14 BA35X-ME terminators boards— split-bus mode
SW822-LA/LB	SW800 StorageWorks Cabinet with three BA350-MB RAID controller shelves, 18 BA356-JC device shelves, 18 BA35X-MG 8-bit I/O personality modules for BA356, 18 BN21H-02 SCSI-2 single-ended cables, 21 BA35X-HF redundant power supplies
HSZ40-TL	Two HSZ40B SCSI RAID array controllers each with 32 MB cache, HSZ Traditional License (QL-2YJA9-AA), RAID HSZ40 Firmware License (QL-3J0A9-AA), Mirror Firmware HSZ40 Traditional License (QL-4DTA9-AA), BN21K-20 20-meter cable, BN21L-0B .15-meter cable

Step 7b—External Storage (I/O Expansion Cabinet)

I/O expansion cabinet (H9F00-BA/BB/BC/BD) provides space for up to six SCSI disk plug-in units (PIU) if no other PCI/XMI plug-in unit (PIU) is configured in the expansion cabinet. Each of the two pairs of expansion bays in the bottom of the cabinet can hold one Battery PIU, one PCI PIU, one XMI PIU, or two SCSI disk PIUs. Two expansion bays in the top of the expansion cabinet can hold up to two SCSI disk PIUs. Disk and tape drives supported are the same as Step 7 Internal Storage.

Step 7c—External Storage

The following list describes available disk storage devices and capacities. These supported options can be added as required.

Storage Cabinets	Capacity
SW5XX, SW8XX	6–227 GB
SCSI Disk Drives	Capacity
See Step 7	
Tape Drives	
TZ87, TZ875*, TZ877, TZ88, TZ885, TZ887, TSZ07, TKZ9E, TKZ60, TKZ61, TKZ62, TL810, TL812, TL820, TL822, TL826, DS-TL893-BA†, DS-TL894-BA†, DS-TL896-BA†	See <i>Storage Devices</i> for ordering information.
Optical Libraries	
RW546-ZA	36 GB Optical Library, 2 drives
RW551-ZC	73 GB Optical Library, 2 drives
RW552-ZF	147 GB Optical Library, 4 drives
RW555-ZF	294 GB Optical Library, 4 drives
RW557-ZF	547 GB Optical Library, 6 drives

* Loader support for DIGITAL UNIX is available via DECnsr.

† Not supported on KZMSA XMI SCSI controllers.

Step 8—Networks and Communications

Two twisted-pair 802.3/Ethernet controllers on KFTIA-AA system I/O module included with Base Server; DE500 fast ethernet network interface card included with Expanded Base Server. See Step 5 for twisted-pair Ethernet cable part number. Optional DEFPZ-AA/UA (FDDI) daughter card can be installed on KFTIA-AA system I/O module. Select additional devices if required. **Note:** Connection of system to Ethernet requires twisted-pair cable. See *Network Products Guide* for details.

LAN Communications Controllers—KFTIA-AA Daughter Cards

- .. Maximum one FDDIcontroller fiber daughter card per KFTIA-AA I/O module

DEFPZ-AA	FDDIcontroller Fiber—Single Attachment Station—daughter card for mounting on KFTIA-AA. Requires BN24x cable.
BN24E-xx	Fiber-Optic Cable, Dual 2.5mm Bayonet “ST” type connectors
BN24D-xx	Fiber-Optic Cable, Dual 2.5mm Bayonet “ST” type connector to FDDI “MIC” connector
DEFPZ-UA	FDDIcontroller Fiber—Twisted-pair Copper—daughter card for mounting on KFTIA-AA. Requires BN26x cable.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable

LAN Communications Controllers—PCI based

- .. Requires DWLPB-AA/AB/BA/BB
- .. System maximum of six DEFPA-AB/DB/UB/MB FDDIcontrollers.

DE450-CA	PCI-to-Ethernet 3-port Adapter (uses one PCI slot). OpenVMS (V6.2) and DIGITAL UNIX (V3.2C) support eight per PCI, maximum eight per system. Two patch kits required to support DE450 with OpenVMS V6.2.
SN-PBXNP-AC	PCI Token Ring Adapter. Uses one PCI slot. Digital UNIX V3.2G or V4.0B supports two per PCI, maximum two per system. Minimum system console support for this adapter is V4.0 AXP CD release. Requires BC26M cable.
PBXDA-AA	PCI Asynchronous 4-port Communication Adapter. OpenVMS v6.2-1H3 supports two per PCI, maximum two per system.
PBXDA-AB	PCI Asynchronous 8-port Communication Adapter. OpenVMS v6.2-1H3 supports two per PCI, maximum two per system.
DE500-AA	Fast Ethernet (100 Mbit) PCI Adapter (uses one PCI slot). DIGITAL UNIX V3.2C and OpenVMS V6.2 and 7.1 support. Up to eight per PCI, maximum eight per system.
DEFPA-AB	FDDIcontroller Fiber—Single attachment station MultiMode Fiber (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. Requires BN34x “SC” type connecting cable.
DEFPA -DB	FDDIcontroller Fiber—Dual attachment station MultiMode Fiber (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. Requires BN34x “SC” type connecting cable.
BN34A-xx	MultiMode Fiber-Optic Duplex cable—“SC” connector to “ST” connector
BN34B-xx	MultiMode Fiber-Optic Duplex cable—“SC” connector to “SC” connector
BN34D-xx	MultiMode Fiber-Optic Duplex cable—“SC” connector to “MIC” connector
DEFPA-MB	FDDIcontroller Copper—Dual attachment station UTP (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. . Requires BN26x or BN25H connecting cables.
DEFPA-UB	FDDIcontroller Copper—Single attachment station UTP (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. . Requires BN26x or BN25H connecting cables.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable
BN25H-03	3-meter Unshielded twisted pair RJ45 connectors
DGLPB-AB	ATMworks 350 ATM PCI bus adapter (uses one PCI slot). DIGITAL UNIX V4.0a supports four per PCI, maximum four per system.

Step 8—Networks and Communications (*continued*)

LAN Communications Controllers—EISA based

- .. Requires DWLPB-AA and KFE70-AA, EISA bridge module set.
- .. See EISA Bus IRQ Address Table.

DNSES-AA	Synchronous Communications Controller (uses one EISA slot). DIGITAL UNIX supports two per EISA, maximum two per system. OpenVMS supports one per EISA, maximum one per system. Requires a BC19x cable.
BC19B-02	EIA-422-A/V.11 adapter cable, can be extended with BC55D-33
BC19D-02	EIA-232-D/V.24 adapter cable, can be extended with BC22F-xx
BC19E-02	EIA-423-A/V.10 adapter cable, can be extended with BC55D-33
BC19F-02	V.35 adapter cable, can be extended with BC19L-25
DW300-AA	Token Ring Adapter (uses one EISA slot). DIGITAL UNIX and OpenVMS V6.2 plus remedial stream TIMA kit (TPPR 614) support one per EISA, maximum one per system. Requires BN26M cable.
BN26M-xx	802.5/Token Ring twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable.
CXI01-AA	Digiboard Asynchronous Xem/ISA Multiport Serial Card with 16 RJ45 PORTS/Xem Port (uses one EISA slot). DIGITAL UNIX only, supports one per EISA, maximum one CXI01-AA/AD per system.
CXI01-AB	Digiboard PORTS/Xem, 16 RJ45 Port Concentrator —mounts separately from PCI bus. Maximum of three CXI01-AB can be attached to CXI01-AA, provides up to 48 additional ports. DIGITAL UNIX only.
CXI01-AD	Digiboard Asynchronous EPC/X Multiport Serial Card with 16 RJ45 Port EPC/CON-16 Concentrator (uses one EISA slot). DIGITAL UNIX one per EISA, maximum one CXI01-AA/AD per system. DIGITAL UNIX only.
CXI01-AE	Digiboard EPC/CON-16 Concentrator mounts separate from PCI bus. Maximum three CXI01-AE can be attached to the CXI01-AD provides up to 48 additional ports. DIGITAL UNIX only.
CXI01-AC	Digiboard RJ45 to DB25 Male Converter
CXI01-AF	Digiboard RJ45 to DECMJ11 Adapter—8 per package

LAN Communications Controllers—XMI based

DEMNA-M	802.3/Ethernet controller XMI-to-Ethernet adapter, (uses one XMI slot). OpenVMS supports four per XMI, maximum six per system. DIGITAL UNIX supports six per XMI, maximum eight per system.
CK-DEMNA-KN	DEMNA cabinet kit, required with DEMNA-M
DEMFA-AA	DEC FDDIcontroller 400 XMI-to-FDDI adapter, Single attachment station with fiber MIC connector; (uses one XMI slot). OpenVMS supports four per XMI, maximum four per system. DIGITAL UNIX supports seven per XMI, maximum eight per system.

Local and Wide Area Communications Servers

Each communications server requires 802.3/Ethernet connection. Depending on the server selected, either ThinWire BNC-type connection (e.g., BC16M cable) or thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Additional items also required—see *Network Products Guide* for ordering information.

Network Connectivity Products

See *Network Products Guide* for details.

Step 8a—MEMORY CHANNEL Controller

DIGITAL UNIX Systems

- .. Require DIGITAL UNIX V3.2E (DIGITAL UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- .. Each system node in a MEMORY CHANNEL cluster requires a software license.
- .. Servers in a compute-server array require a DIGITAL UNIX Driver for MEMORY CHANNEL License.
- .. Servers in a TruCluster high-availability environment require a license for TruCluster for DIGITAL UNIX.
- .. The following options are not currently supported with MEMORY CHANNEL: DJ-ML200, DNSES-AA, CIPCA, CIXCD

OpenVMS Systems

- .. Require OpenVMS V7.1 and OpenVMS Cluster License.
- .. On systems with DWLPA-AA/AB/BA/BB and no other PCI option(s) and/or KFE70-AA, a maximum of two CCMAA-BA modules are supported.
- .. On systems with DWLPA-AA/AB/BA/BB and any PCI option(s) and/or KFE70-AA, a maximum of one CCMAA-BA module is supported.
- .. DWLPB-AA/AB/BA/BB option **does not** have the restrictions of the DWLPA-AA/AB/BA/BB.
- .. DNSES-AA is not currently supported with MEMORY CHANNEL.

MEMORY CHANNEL requirements for currently installed AlphaServer 8400 systems:

- .. Console firmware at revision V2.3 or higher.
- .. CCMAA-BA Adapter must be installed in slots 0-7 of a DWLPA-AA/AB/BA/BB PCI; no restriction for DWLPB-AA/AB/BA/BB PCI bus.
- .. For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- .. For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- .. CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards, except TruCluster Production Server configurations.

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAQ-AA	TruCluster Software for DIGITAL UNIX
QB-4ZCAQ-AA	DIGITAL UNIX Driver for MEMORY CHANNEL license
QL-MUZAQ-AA	OpenVMS Cluster license for Alpha systems

CCMHA-AA, MEMORY CHANNEL Hub, includes BN19P-2E line cord for Canada, Japan, US operation.
For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19S-2E	Egypt, India
BN19C-2E	Central Europe
BN18L-2E	Israel
BN19E-2E	Switzerland
BN24X-2E	Italy
BN19K-2E	Denmark
BN19H-2E	Australia, New Zealand

Step 9—Console Terminal

- .. Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.
- .. Shielded console cable is included for connection to the console terminal.

VT510-xx VT510 terminal

LA30N-xx LA30 printer

LK461-xx/LK46W-xx Keyboard

Step 10—Expansion—System Cabinet and I/O Expansion Cabinet

Step 10a—System Cabinet

- .. System Cabinet includes one three-phase power regulator with space for two additional three-phase power regulators. System cabinets shipped after June 1996 (H9F00-FC/FD/FE Rev B03 or greater) include the H7263-AC/AD non-battery back-up ready power regulator. See Step 11 for power expansion options for these system cabinets.
- .. Maximum four I/O channels per cabinet allowed. PCI and XMI plug-in units each require one I/O channel connection.
- .. Four lower expansion bays are available for plug-in units. The lower bays accommodate plug-in units as follows.

AlphaServer 8400 System Cabinet

Expansion Bay Location	Plug-In Unit (PIU)	Quantity	Expansion Bays Occupied
Lower	Disk plug-in unit (BA660-AB)	Four maximum	Front or Rear
Lower	XMI plug-in unit (DWLMA-AA)	Two maximum	Front and Rear
Lower	Battery plug-in unit(H7237-AA/AC/CA/CB)	One maximum	Front and Rear
Lower	PCI plug-in unit (DWLPB-AA)	Two maximum	Rear only

Step 10b—I/O Expansion Cabinet

- .. I/O Expansion Cabinet includes one three-phase power regulator
 - Provides space for two additional three-phase power regulators
- .. H9F00-BA/BB/BC Rev D03 or later cabinets include the H7263-AC or H7263-AD non-BBU capable power regulator. Refer to Step 11 for expansion options.

H9F00-BA/BB/BC I/O expansion cabinet—Three phase power, maximum two per system.
Note: -BA = 60 Hz, 208V, -BB = 50 Hz, 380/416V, -BC = 50/60 Hz, 202V.

- .. Expansion cabinet can be configured to hold all disk plug-in units or combination of disk plug-in units and PCI or XMI plug-in units.
 - Six expansion bays—two upper and four lower—are available for plug-in units. The two upper bays accommodate maximum of two disk plug-in units. The four lower bays accommodate plug-in units as follows:

Expansion Bay Location	Plug-In Unit (PIU)	Quantity	Expansion Bays Occupied
Upper	Disk plug-in unit (BA660-AB)	Two maximum	Front or Rear
Lower	Disk plug-in unit (BA660-AB)	Four maximum	Front or Rear
Lower	PCI plug-in unit (DWLPB-AB)	Two maximum	Rear only
Lower	XMI plug-in unit (DWLMA-BA)	Two maximum	Front and Rear
Lower	Battery plug-in unit(H7237-AA/AC/CA/CB)	One maximum	Front and Rear

Step 11—Power Expansion Components

- .. System Cabinet and Expansion Cabinets must be same type; either three-phase or single-phase. Mixing of three-phase and single-phase cabinets in same system configuration is not allowed.
- .. Determine the need for adding second power regulator by filling in the EPU- Power Configuration Table. **Note:** The Power Configuration Table provides a manual method for determining the need of second power regulator. Equivalent power unit (EPU) is an equivalent value of power used (48 VDC) by each option.

Step 11a—Three-Phase Expansion Components

For new system orders, or for systems shipped after June 1996:

- .. Select additional **H7263-AC/AD** for systems that **do not** require battery back-up option
 - If EPU value of 1st regulator is exceeded
 - If N+1 redundancy is required
 - If 2nd or 3rd power regulator is required
- .. Select **H7237-CA/CB** for systems that require battery back-up option (Factory Installed)
 - Includes battery plug-in-unit, one H7263-AA/AB power regulator and batteries for battery backup/UPS capability. Must be ordered at time of system purchase if BBU functionality is required. The H7263-AA/AB mounts alongside the standard H7263-AC/AD.
- .. Select **H7238-BA/BB** for additional battery UPS (Factory Installed)
 - Includes H7263-AA/AB and H7238-AA 4-pack battery option for second and third regulator support

For systems shipped prior to June 1996, select the following power options

H7263-AA/AB*	Three-Phase 48 VDC power regulator with BBU capability—maximum three per cabinet. Second regulator may be required to supply adequate power depending on configuration. Third regulator assures N+1 power redundancy and higher availability in the event of power regulator failure. See Power Configuration Table.
H7237-AA*	Battery plug-in unit with batteries for battery backup/UPS capability—maximum one per cabinet. Use in system cabinet and/or H9F00-BA/BB/BC expansion cabinet. Includes four batteries to support 48 V power regulator and cabling for additional H7238-AA battery options.
H7238-AA*	4-pack battery option—one required per optional 48 V power regulator to support battery backup/UPS capability. For use only with the H7237-AA.

* Will ship as **spare** from Manufacturing

Battery backup I/O expansion cabinet

H9B00-AF	Battery option for I/O Expansion Cabinet—fully loaded battery cabinet supports three power regulators, provides for 60 minutes uninterruptible power (UPS). Maximum one per H9F00-BA/BB/BC expansion cabinet.
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Step 11b—Single-Phase to Three-Phase Power Upgrade

- .. Includes new AC distribution box with attached line cord, DC subrack, one three-phase 48VDC power regulator.
 - .. If single phase power system has two power regulators, an additional three-phase 48VDC power regulator is required.
- | | |
|--------------------|---|
| H7268-AA/AB | Single-Phase to Three-Phase Upgrade Kit, Converts system to three-phase power subsystem.
-AA= 60 Hz, 208V, -AB = 50 Hz, 380/416V |
|--------------------|---|

Step 11c—Power Option for StorageWorks Shelves in StorageWorks Plug-in-Units

- .. Provides N+1 power for BA660-AB, BA661-AA StorageWorks PIUs/shelves.
 - .. Occupies one slot in StorageWorks shelf.
- | | |
|-----------------|---|
| BA35X-HG | 48V DC 150W Redundant Power Supply for BA660-AB, BA661-AA—includes 48VDC jumper cable for connecting to first power supply in StorageWorks shelf. |
|-----------------|---|

Step 12—Software

Select user licenses and additional software as required. Media and documentation recommended for first system on site.

Software Processor Code = Q

DIGITAL UNIX Concurrent Use Licenses

DIGITAL UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

Note: DIGITAL UNIX 8400 5/440 Mhz CPU Base Servers and Expanded Base Servers include traditional unlimited user license.

QL-MT7AM-3B	DIGITAL UNIX Concurrent Use 1-user license
QL-MT7AM-3C	DIGITAL UNIX Concurrent Use 2-user license
QL-MT7AM-3D	DIGITAL UNIX Concurrent Use 4-user license
QL-MT7AM-3E	DIGITAL UNIX Concurrent Use 8-user license
QL-MT7AM-3F	DIGITAL UNIX Concurrent Use 16-user license
QL-MT7AM-3G	DIGITAL UNIX Concurrent Use 32-user license
QL-MT7AM-3H	DIGITAL UNIX Concurrent Use 64-user license
QL-MT7AQ-AA *	DIGITAL UNIX Traditional unlimited user license
QL-MT5AQ-AA	DIGITAL UNIX developer's extension license
QL-MT6AQ-AA *	DIGITAL UNIX server extension license
QL-MTJAQ-AA	DECnet/OSI end-system license
QL-MTKAQ-AA	DECnet/OSI extended function license
QB-05SAQ-AA	DECsafe Available Server license and documentation (DIGITAL UNIX only). Media available on layered product CD-ROM. KZMSA or KZPSA adapter required.

* Included in 5/440 DIGITAL UNIX Base and Expanded Base Servers.

DIGITAL UNIX Media and Documentation

QA-MT4AA-H8	DIGITAL UNIX media and on-line documentation (base system, complementary products) on CD-ROM
QA-MT4AA-GZ	DIGITAL UNIX full hardcopy documentation
QA-MT4AB-GZ	DIGITAL UNIX end user hardcopy documentation subkit
QA-MT5AA-GZ	DIGITAL UNIX developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	DIGITAL UNIX server extension hardcopy documentation subkit

OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AQ-AA	OpenVMS Traditional unlimited user license

Step 12—Software (*continued*)
OpenVMS

QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI extended function license
QL-MUZAQ-AA	OpenVMS cluster software license. Required with each system that connects to an OpenVMS cluster.

OpenVMS Media and Documentation

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-09SAA-GZ	OpenVMS base hardcopy documentation
QA-001AA-GZ	OpenVMS full hardcopy documentation

Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DIGITAL UNIX
QA-03XAA-H8	Layered products media and documentation for OpenVMS

Open VMS Layered Products CD-ROM

QA-03XAA-H8 *	Layered products media and documentation for OpenVMS
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* Includes DIGITAL Enterprise Integration Server for OpenVMS media and documentation

DIGITAL Enterprise Integration Package—included in 5/440 Base Servers and Expanded Base Servers

QA-5LVAA-H8	DIGITAL Enterprise Integration Server for OpenVMS media and documentation
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DIGITAL NAS Base Server 200 Software

DIGITAL NAS 200 Base Server software included with base 5/300 MHz AlphaServer 8400 systems. Media available on layered product CD-ROM.

Step 13—Hardware and Software Supplemental Support Services
Hardware—Americas and Asia Pacific only

- .. Systems include one-year hardware warranty, on-site, same day, 4-hour response time.
- .. Select optional Hardware Supplemental Support Services if required.

AlphaServer 8400

Two CPUs with less than 2 GB memory		Two CPUs with 2 GB memory
FM-4Y4HR-36	FM-4Z4HR-36	Years 1-3, 5 x 9, 4-hour response time
FM-4Y512-36	FM-4Z512-36	Years 1-3, 5 x 12, 4-hour response time
FM-4Y616-36	FM-4Z616-36	Years 1-3, 6 x 16, 4-hour response time
FM-4Y724-36	FM-4Z724-36	Years 1-3, 7 x 24, 4-hour response time
FM-4Y4HR-60	FM-4Z4HR-60	Years 1-5, 5 x 9, 4-hour response time
FM-4Y512-60	FM-4Z512-60	Years 1-5, 5 x 12, 4-hour response time
FM-4Y616-60	FM-4Z616-60	Years 1-5, 6 x 16, 4-hour response time
FM-4Y724-60	FM-4Z724-60	Years 1-5, 7 x 24, 4-hour response time

Step 13—Hardware and Software Supplemental Support Services (*continued*)
Software—Americas and Asia Pacific only

- .. Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- .. Software service upgrades for DIGITAL UNIX and OpenVMS include advisory and remedial software support with new version license rights for operating system and DIGITAL NAS Base Server 200 for the time period indicated.

AlphaServer 8400 Two CPU Systems

FM-84DOS-12	12-month Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-84DOS-36	36-month Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-84DOS-60	60-month Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-84DVM-12	12-month Software Supplemental Support for OpenVMS two CPU systems
FM-84DVM-36	36-month Software Supplemental Support for OpenVMS two CPU systems
FM-84DVM-60	60-month Software Supplemental Support for OpenVMS two CPU systems

Step 13a—Hardware and Software Supplemental Support Services (Europe only)

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

AlphaServer 8400 Power Configuration Table

AlphaServer 8400 EPU (Equivalent Power Units)—Power Configuration Table

- .. Second power regulator may be needed to supply additional 48V power to the system.
- .. Mixing of three-phase and single-phase power regulators in system configuration is not allowed.
- .. Use chart to determine need for second power regulator.
- .. If EPU is greater than 80, order second power regulator (three-phase regulator—H7263-AC/AD) or H7263-AA/AB if BBU is required).
- .. EPU must not exceed 180.

Options	EPU Values System Cabinet Options	Quantity	Total EPU (Qty times EPU)	EPU Values Expansion Cabinet Options	Quantity	Total EPU (Qty times EPU)
Base system includes power regulator, CPU module, system I/O module, memory module	30	1	30			
I/O expansion cabinet (H9F00-BA/BB/BC) includes one power regulator					1	0
Additional 5/300 CPU modules—751P1-AX, 751P2-AX	11					
Additional 5/300 CPU modules—752P1-AX, 752P2-AX	13					
Additional 5/350 CPU modules—753P1-AX, 753P2-AX	12					
Additional 5/350 CPU modules—754P1-AX, 754P2-AX	14					
Additional dual 5/440 CPU modules—756P1-AX, 756P2-AX	8					
KFT1A-AA System I/O module	4					
KFTHA-AA System I/O module	3					
MS7CC-BA 128 MB memory	5					
MS7CC-CA 256 MB memory	5					
MS7CC-DA 512 MB memory	5					
MS7CC-EA 1 GB memory	5					
MS7CC-FA 2 GB memory	5					
MS7CC-GA 4 GB memory	5					
Add PCI options						
DWLPB-AA/AB/BA/BB	1					
KZPSA-BB	1					
KZPSC-AA/BA, KZPAC-AA/CA/CB	1					
DE435-AA, DE450-AA, DE500-XA, DE500-AA	1					
DEFPA-AB/DB/UB/MB	1					
KFE70-AA	1					
Add EISA options						
DNSES-AA	1					
DW300-AA	1					
CXI01-AA/AD	1					
Add XMI options						
DWLMA XMI plug-in unit	4					
KZMSA-AB XMI SCSI controller	3					
KFMSB-AA DSSI disk/tape adapter	3					
CIXCD-AC XMI CI controller	4					
DEMNA-M XMI Ethernet controller	3					
DEMFA-AA XMI FDDI adapter	5					
Disk and Tape options						
8-bit SCSI disk drives	1					
16-bit SCSI disk drives	1					
TLZ07, TLZ09, TLZ9L, TLZ15-VA SCSI tape drive	1					
TZ86, TZ87, TZ88 -VA SCSI tape drive	3					
DWZZA-VA/DWZZB-VW SCSI signal converter	0					
Total						

Note: Depending on configuration, system offers integral UPS capability that supports all in-cabinet components for at least 11 minutes. If UPS support is required for external devices, e.g., console terminals, terminal servers, printers, and modems, a universal UPS can be ordered separately.

Optional Controller Configuration Table

With multiple adapters that provide the same interface available on different I/O buses (PCI or XMI), it is possible to exceed operating system limit on number of ports supported for that interface. Follow these guidelines for maximum number of ports that each operating system will support. Fill in table under the relevant area, add up the number of controllers/ports available, and verify the operating system limits will not be exceeded. **Do not exceed these values.**

Option Name	A Number of Ports/Buses	B Number of Options	C Total Ports (A * B)	DIGITAL UNIX Limit	OpenVMS Limit
SCSI Options					
Included KFTIA-AA I/O module, one single-ended and three FWD SCSI ports*	4	1	4		
Additional KFTIA-AA I/O module, one single-ended and three FWD SCSI ports	4				
KZPSA-BB PCI fast wide differential SCSI adapter	1				
KZMSA-AB XMI fast single-ended SCSI adapter	2				
Add column "C" —must be less than or equal to value listed under operating system to be used.				32	26
802.3/Ethernet Options					
Included KFTIA-AA I/O module, two 802.3/Ethernet ports*	2	1	2		
Additional KFTIA-AA I/O module, two 802.3/Ethernet ports	2				
DE435-AA PCI 802.3/Ethernet controller, DE450 , DE500	1				
DEMNA-M XMI 802.3/Ethernet controller	1				
Add column "C" —must be less than or equal to value listed under operating system to be used.				8	8
FDDI Options					
Included KFTIA-AA I/O module, optional FDDI daughter card installed (DEFPZ-AA/UA)*	1				
Additional KFTIA-AA I/O module, optional FDDI daughter card installed (DEFPZ-AA/UA)	1				
DEFPA-AB/-DB/-UB/MB PCI FDDI controller, one port each	1				
DEMFA-AA XMI FDDI controller	1				
Add column "C" —must be less than or equal to value listed under operating system to be used.				8	8

EISA Bus IRQ Address Table**Configuration Rules and Information**

- .. EISA Bus IRQ address assignments are for DIGITAL UNIX and OpenVMS systems only.
- .. In some cases, the maximum number of each supported device is less than the number of EISA bus addresses available; this is due to other limitations.
- .. Only one device can occupy any given IRQ address; if multiples of a device are configured, each device occupies separate address.
- .. Match each device to one available address. (Note: With the table as a worksheet, fill in "0" for each device; fill in only one "0" per column.)
- .. Actual IRQ address assignment will be made by the EISA Configuration Utility (ECU), which is run during system manufacture, or in the installed system if the EISA bus is reconfigured.

Option	EISA Bus IRQ Addresses										Maximum of Each Supported	
	5	7	8	9	10	11	12	14	15		OpenVMS	DIGITAL UNIX
DNSES-AA	—	—	0	0	0	0	0	0	0		1	2
DW300-AA	0	—	—	0	0	0	—	—	0		1	1
CXI01-AA	NA	NA	NA	NA	NA	NA	NA	NA	NA		1	1
CXI01-AD	NA	NA	NA	NA	NA	NA	NA	NA	NA		1	1

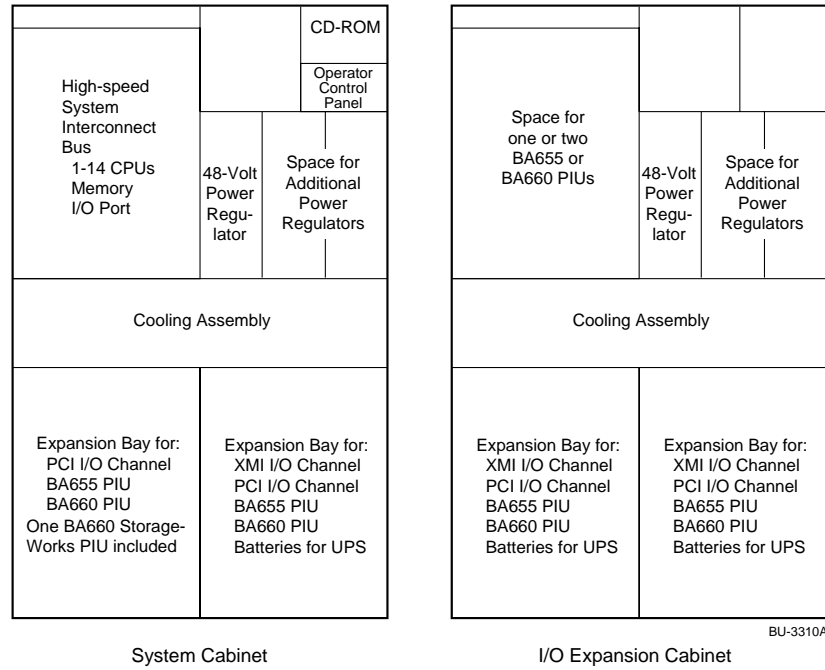
Table Codes:

0 = address is available for device,

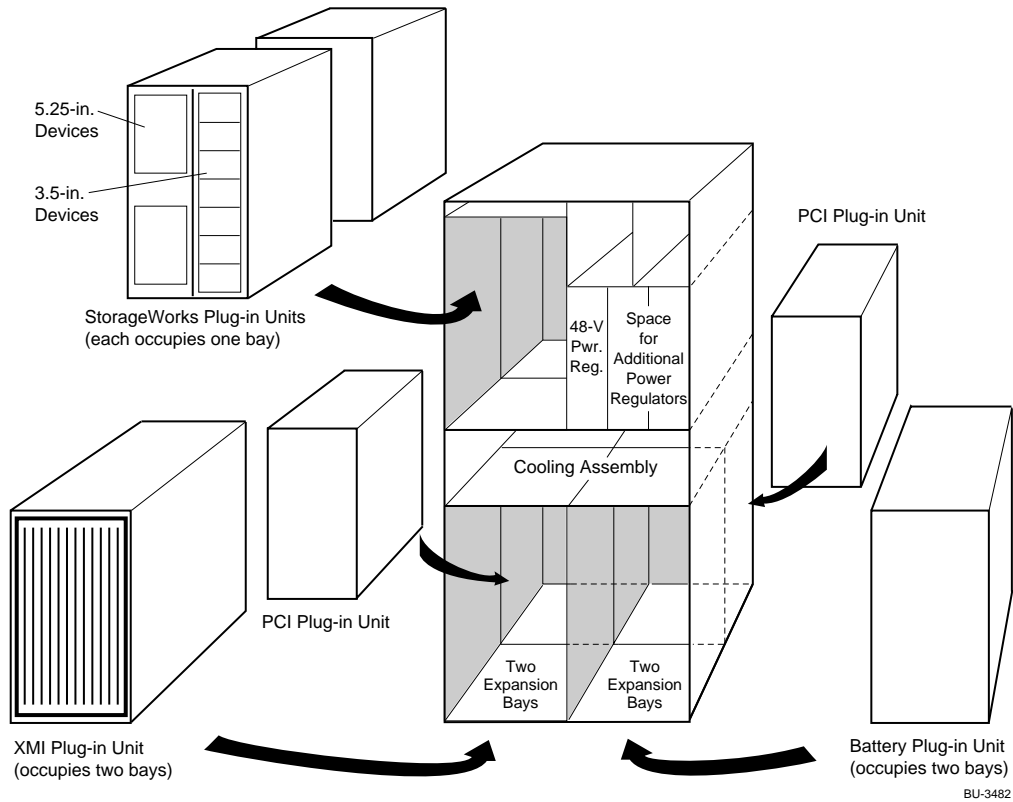
— = address not available for device

NA = Not Applicable

System Diagram



Note: Three-Phase Power Systems support up to three Power Regulators.



Specifications

Physical Characteristics	Operating	Shipping	
Height	170.0 cm (67.0 in.)	195.0 cm (76.7 in.)	
Width	80.0 cm (31.5 in.)	109.5 cm (43.1 in.)	
Depth	87.5 cm (34.4 in.)	121.0 cm (47.5 in.)	
Weight, full configuration			
Without batteries	408 kg (900 lb.)	448 kg (1000 lb.)	
With batteries	545 kg (1200 lb.)	585 kg (1300 lb.)	
Clearances	Operating	Service	
Front	1.0 m (40 in.)	1.5 m (59 in.)	
Rear	1.0 m (40 in.)	1.0 m (40 in.)	
Sides	0	0	
Environmental	Operating	Non-Operating	
Temperature	15° to 28°C (59° to 82°F)	–40° to 66°C (–40° to 151°F)	
Humidity	20% to 80%	10% to 95%	
Altitude	0–2.4 km (0–8000 ft)	9,100 m (30,000 ft)	
Vibration	2–22 Hz @ 0.01"da minimum	22–500 Hz @ 0.25g max.	
Heat dissipation ¹	Minimally configured system¹ (system cabinet) 3,400 Btu/hr, 1,000 W Fully configured system² (system cabinet) 15,700 Btu/hr, 4,600 W Fully configured system³ (system cabinet with two I/O expansion cabinets) 30,600 Btu/hr, 9,000 W		
Regulatory			
Agency approvals	UL Listed to UL1950 UL Classified to IEC950 CSA Certified to CAN/CSA-C22.2, No. 950-M89 FCC Part 15 (Class A) CE Declaration #1171		
Reviewed to	AS 3260, Australian Standard EN 60950, European Norm		
Power Requirements ¹			
Three-Phase Power Subsystem ²	US/Canada	Europe/AP	Japan
Nominal voltage	120/208 V	380–415 V	202 V
Frequency range	50–60 Hz	50–60 Hz	50–60 Hz
Phases	3-phase star 4-wire N-GND	3-phase star 4-wire N-GND	3-phase delta 4-wire mid-GND or 3-wire junction GND
Maximum input current/phase	24 A rms	12.8 A rms	24 A rms
Surge current	50 A peak	50 A peak	50 A peak
Rating	30 A	16 A	30 A
Power cap (system)	DEC 12-12314-00	DEC 12-30333-02	DEC 12-12314-00
Receptacle (site)	DEC 12-12315-01	See footnote 4	DEC 12-12315-01
(Industry equivalent)	NEMA L21-30R	IEC 309	NEMA L21-30R
PCS/PDS/PDU/UPS cable	BC24W	BN29X	BC24W

1 Minimally configured system contains one regulator, one CPU module, one memory module, one KFTIA-AA module, CD-ROM, and RZ28 disk drive.

2 Fully configured system contains two power regulators, four CPU modules, three memory modules, two System I/O modules, one DWLPB-AA, one DWLPB-BA, three BA655-AB, CD-ROM, 36 RZ28 drives.

3 Fully configured system and expansion cabinets consist of the above “fully configured system” and two expansion cabinets which each contain one DWLPB-AB, one DWLPB-BB, six KZPSA-BB, five BA655-AB, and 60 RZ28 drives.

4 Receptacle type is Hubbell 516R6 or equivalent

UPS Solutions

For complete protection, UPS products should be used with data line surge protectors. See TVSS section of Environmental Products Chapter.

4N-GA249-AB	2 wire modem	wall plug in
4N-GA249-CA	10BaseT	wall plug in
4N-GA510-BF	ThinWire	device port
4N-GA245-xx	Din rail and modules	up to 32 ports

	Receptacle Module for Plug-in Connection			
UPS Model	60 HZ	50 HZ	AlphaServer 8400	External Storage
4N-AEAAL-BA	4N-AEACK-BN	Hardwired	Single phase	None, SW500, or Expansion Cabinet
4N-AEAAN-BA (60 Hz) 4N-AEAAN-BE (50 Hz)	4N-AEACM-BN	Hardwired	Single phase	SW800
4N-AEAAN-BA (60 Hz) 4N-AEAAN-BE (50 Hz)	4N-AEACM-BK	Hardwired	Three Phase	None
4N-AEAAN-BA (60 Hz) 4N-AEAAN-BE (50 Hz)	4N-AEACM-PA	Hardwired	Three Phase	SW800 or Expansion Cabinet

UPS Models

4N-AEAAL-BA	PUPS plus 10kVA (7kW), single-phase, 50/60Hz, 176-276V in, 200-240V out, 9 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAN-BA	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, 176-256V in, 200-240V out, 10 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAN-BE	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, International model rated 380/415V in, 380/415/220V out; hardwired input/output.

Options

4N-AEACK-BN	PUPS plus 10kVA receptacle module (3) L6-30R, (3) 5-20R2, (2) L5-20R
4N-AEACM-BK	PUPS plus 15kVA receptacle module (2) L21-30R, (3) 5-20R2
4N-AEACM-BN	PUPS plus 15kVA receptacle module (2) L6-30R, (2) L21-30R, (1) 5-20R2
4N-AEACM-PA	PUPS plus 15kVA dual receptacle module: Module 1: (2) L21-30R and conduit kit for connecting Module 1 to Module 2 Module 2: (2) L21-30R, (3) 5-20R2

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

Note: Power Management software is included in ServerWORKS Manager kits shipping with all AlphaServers. Cable kit required, select UPS Communications Cable Kit

DIGITAL UNIX ¹	OpenVMS	
4N-ONLIN-NT ¹	4N-ONLIS-FE	UPS Communications Cable Kit
4N-AEAEO-Dx ²	4N-JMIU4-AB ³	4 port Hardware Option for multi-systems on one UPS
4N-AEAEO-Dx ²	4N-AEAEO-Dx ²	Option for SNMP/ ServerWORKS Manager interface

Ala Carte Software kits available for existing installations

DIGITAL UNIX ¹	OpenVMS	
4N-AEAES-AK	4N-AEAES-EM	Prestige (single system)
4N-AEAES-AK	4N-AEAES-FM	PUPS Plus (single system)
4N-AEAES-BK	4N-JMMCR-AA ⁴	2 port Multi-systems on one UPS
	4N-JMIU4-AA	4 port
	4N-JMIU8-AA	8 port
4N-AEAEO-Dx	4N-AEAEO-Dx	Network Monitoring

1. Connect-UPS network adapter required for operation on AlphaServer 8400 DIGITAL UNIX systems. See footnote 2.
2. Connect-UPS network adapter; D* denotes Twisted Pair / ThinWire = DA/DC (60Hz; 120V NEMA); DB/DD (50Hz: 240V IEC)
3. Multi-port interface kit with splitter cable to interface with network adapter and local shutdown signal from UPS. Kits may be daisy chained, kits include software
4. Same as 3 above except 2 port for basic shutdown and one smart monitoring port